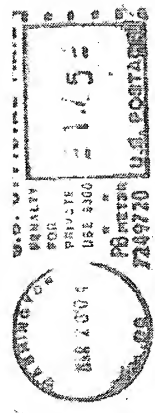


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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,773	12/21/2001	George D. Papasouliotis	M-5091-2P US	4530
	7590 03/26/2004			
Tom Chen SKJERVEN MORRILL MacPHERSON LLP 25 Metro Drive Suite 700 San Jose, CA 95110			EXAMINER MERCADO, JULIAN A	
			ART UNIT 1745	PAPER NUMBER
DATE MAILED: 03/26/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/035,773

Applicant(s)

PAPASOULIOTIS ET AL.

Examiner

Julian Mercado

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Remarks

This application is a CIP of parent application 09/053,554 which is now U.S. Patent 6,395,150 B1.

The examiner notes that U.S. Pat. 5,872,058 to Van Cleemput et al. is precluded from being applied as a basis for a prior art rejection in this Office action in view of applicant's declaration under 37 C.F.R. § 1.132 in the parent application, wherein applicant declared sole inventorship of all the subject matter disclosed in the '058 Patent.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims recite that hydrogen is an inert component. This characterization is indefinite in consideration of hydrogen as a gas easily catching on fire and being highly explosive, e.g. the notoriously known Hindenburgh disaster. Additionally, inert components are generally limited in the art as those among the noble gases helium, neon, argon, krypton, xenon and radon, i.e. Group VIII in the Periodic Table.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 2, 5, 7-16, 19-27 and 30-35 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 4 of U.S. Patent No. 5,872,058 in view of Dobuzinsky et al. (U.S. Pat. 5,563,105).

Claims 1, 2, 7-9, 11-16, 20-24, 26, 27 and 31-35 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 2, 6 and 9-12 of U.S. Patent No. 6,395,150 B1 in view of in view of Dobuzinsky et al. (U.S. Pat. 5,563,105).

The claimed subject matter of the '058 Patent and the '150 Patent will be discussed independently. The teachings of either the '058 Patent or the '150 Patent in view of secondary teachings of the prior art will be discussed in parallel.

The claimed subject matter of the '058 Patent is applied as follows: regarding independent claims 1, 15 and 26 and dependent claims 2, 5, 7-14, 16, 19-25, 27 and 30-35, the '058 Patent recites a process for filling gaps during IC production comprising providing a mixture of silicon-containing, oxygen-containing and inert components such as helium and hydrogen. (see claims 1 and 4) The claimed process further recites depositing a film over said

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gaps by using the gas mixture for simultaneous CVD and sputter etching. (see claim 1)

Hydrogen and helium, which are inert components, are part of the gas mixture. (see claim 4)

The flow rate of the inert components are 0 to 50 sccm which reads on the claimed flow rate of up to 5000 sccm. (see claim 9)

The claimed subject matter of the '150 Patent is applied as follows: regarding independent claims 1, 15 and 26 and dependent claims 2, 7-9, 11-14, 16, 20-24, 27 and 31-35, the '150 Patent recites a process for filling gaps during IC production comprising providing a mixture of silicon-containing, oxygen-containing and one inert component such as helium. (see claim 1) The claimed process further recites depositing a film over said gaps by using the gas mixture for simultaneous CVD and sputter etching. (see claim 1) The flow rate of helium is from 0 to 2000 sccm. (see claim 2) Hydrogen is the one inert component in a second embodiment. (see claim 9)

As to the alleged inventive concept which the examiner recognizes as the use of a fluorine-containing component, while the '058 Patent or the '150 Patent do not recite a fluorine-containing component, Dobuzinsky et al. teaches a fluorine-containing component such as SiF_4 , *inter alia*. (col. 2 line 47-50, col. 3 line 20-28) The skilled artisan would find obvious to modify either the '058 Patent or '150 Patent by employing a fluorine-containing component in order to lower the dielectric constant of the resulting film. (col. 2 line 56-63)

The '058 Patent or the '150 Patent does not recite the uniform plasma to have a plasma density equal to or greater than 5×10^9 electrons per cubic centimeter. However, Dobuzinsky et al. teaches a plasma density of greater than 10^{11} - 10^{12} electrons per cubic centimeter. (col. 2 line

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34-39) The skilled artisan would find obvious to employ the claimed density for reasons such as facilitating a correspondingly uniform deposited film.

Regarding dependent claim 12, the '058 Patent or the '150 Patent does not explicitly recite biasing of the substrate. However, the skilled artisan would find obvious that biasing of the substrate is inherently required during the claimed CVD and sputter etching as recited in claim 1. *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977) and *In re Spada*, 15 USPQ 2d 1655 (Fed. Cir. 1990)

Regarding dependent claims 13, 14, 21, 22, 23, 31 and 32, the examiner notes that applicant discloses the substrate holder as conventional. (see specification, page 10 line 7-12) Additionally, Dobuzinsky et al. teaches a conventional reaction apparatus which also supplies a radio frequency bias (RF) to the electrode. (col. 2 line 11-22) As to the specific power level or frequency bias, absent of unexpected results it is asserted that this is an optimizable parameter for a result-effective variable. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) The power level and frequency of the bias is result-effective in that it directly affects the rate of deposition on the substrate on the electrode.

Regarding dependent claims 2, 19 and 30, the '058 Patent or the '150 Patent does not recite the gas mixture to comprise nitrogen. However, in Dobuzinsky et al. nitrogen in the form of N₂O is part of the gas mixture. (col. 2 line 47-48) The skilled artisan would find obvious to employ nitrogen in recognition of nitrous oxide being an art-recognized equivalent to oxygen or other oxidant gases.

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Claims 3, 4, 6, 17, 18, 28 and 29 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over either the '058 Patent in view of Dobuzinsky as applied to claims 1, 2, 5, 7-16, 19-27 and 30-34 above or the '150 Patent in view of Dobuzinsky et al. as applied to claims 1, 2, 7-9, 11-16, 20-24, 26, 27 and 31-35 above, and further in view of Douglas (U.S. Pat. 4,711,698).

The claimed subject matter of the '058 and '150 Patent are discussed above. The teachings of Dobuzinsky et al. are discussed above.

As to dependent claims 3, 4, 6, 8, 17, 18, 28 and 29, while the '058 Patent or the '150 Patent do not explicitly recite neon, argon, or hydrogen and helium in combination, Douglas teaches that inert gases (which would be inclusive of neon) may be supplied in admixture to a hydrogen/argon gas mixture. (col. 4 line 22-39, col. 6 line 17-22) The skilled artisan would find obvious to employ these gases in the '058 Patent or '150 Patent for reasons such as providing better temperature control or providing for safer handling when explosive gases such as hydrogen are used. (*ib*)

As to the flow rate of helium or fluorine, absent of unexpected results it is asserted that this is an optimizable parameter for a result-effective variable. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) The flow rate of gases introduced into the chamber directly affects the rate of reaction (or dilution thereof) of the resulting mixture of gases.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

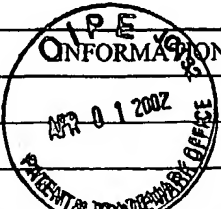
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



iam



Patrick Ryan
Supervisory Patent Examiner
Electronic Business Center 1700

U.S. Department of Commerce, Patent and Trademark Office		Atty Docket No.	Serial No.
		M-5091-2P US	10/035,773
 INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)		Applicant(s)	
		Papasouliotis, George D.; Schravendijk,	
		Filing Date	Group
		December 21, 2001	1745

U.S. Patent Documents

*Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
<i>[Signature]</i>	AA	5,872,058	02/99	Van Cleemput et al.			
<i>[Signature]</i>	AB	5,571,576	11/05/96	Qian et al.	427	574	
<i>[Signature]</i>	AC	5,641,712	06/24/97	Grivna et al.	438	624	
<i>[Signature]</i>	AD	5,621,241	04/15/97	Jain	257	632	
<i>[Signature]</i>	AE	5,376,211	12/94	Harada et al.	156	345	
<i>[Signature]</i>	AF	5,270,264	12/14/93	Andideh et al.	437	228	
<i>[Signature]</i>	AG	5,160,405	11/3/92	Miyauchi et al.	156	643	
<i>[Signature]</i>	AH	5,118,384	06/02/92	Harmon et al.	156	643	
<i>[Signature]</i>	AI	4,937,094	06/26/90	Doehler et al.			
<i>[Signature]</i>	AJ	4,882,299	11/21/89	Freeman et al.	437	233	
<i>[Signature]</i>	AK	4,264,409	04/28/01	Forget et al.	156	643	
<i>[Signature]</i>	AL	3,741,886	06/28/71	Urbanek et al.	204	298	

Foreign Patent Documents

							Translation	
		Document	Date	Country	Class	Subclass	Yes	No
	AM							
	AN							
	AO							
	AP							

OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)

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	AR	
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Examiner *Julian Mercal* Date Considered *3/10/09*

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with your communication to applicant.

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Notice of References Cited	Application/Control No. 10/035,773	Applicant(s)/Patent Under Reexamination PAPASOULIOTIS ET AL.	
	Examiner Julian Mercado	Art Unit 1745	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-6,395,150	05-2002	Van Cleemput et al.	204/192.37
	B	US-5,563,105	10-1996	Dobuzinsky et al.	438/784
	C	US-4,711,698	12-1987	Douglas, Monte A.	438/722
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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Summary

The United States Patent and Trademark Office (Office or USPTO) plans in the near future to: (1) cease mailing copies of U.S. patents and U.S. patent application publications (US patent references) with Office actions except for citations made during the international stage of an international application under the Patent Cooperation Treaty and those made during reexamination proceedings; and (2) provide electronic access to, with convenient downloading capability of, the US patent references cited in an Office action via the Office's private Patent Application Information Retrieval (PAIR) system which has a new feature called "E-Patent Reference." Before ceasing to provide copies of U.S. patent references with Office actions, the Office shall test the feasibility of the E-Patent Reference feature by conducting a two-month pilot project starting with Office actions mailed after December 1, 2003. The Office shall evaluate the pilot project and publish the results in a notice which will be posted on the Office's web site (www.USPTO.gov) and in the Patent Official Gazette (O.G.). In order to use the new E-Patent Reference feature during the pilot period, or when the Office ceases to send copies of U.S. patent references with Office actions, the applicant must: (1) obtain a digital certificate from the Office; (2) obtain a customer number from the Office, and (3) properly associate applications with the customer number. The pilot project does not involve or affect the current Office practice of supplying paper copies of foreign patent documents and non-patent literature with Office actions. Paper copies of references will continue to be provided by the USPTO for searches and written opinions prepared by the USPTO for international applications during the international stage and for reexamination proceedings.

**Description of Pilot Project to Provide Electronic Access to Cited U.S. Patent
References**

On December 1, 2003, the Office will make available a new feature, E-Patent Reference, in the Office's private PAIR system, to allow more convenient downloading of U.S. patents and U.S. patent application publications. The new feature will allow an authorized user of private PAIR to download some or all of the U.S. patents and U.S. patent application publications cited by an examiner on form PTO-892 in Office actions, as well as U.S. patents and U.S. patent application publications submitted by applicants on form PTO/SB08 (1449) as part of an IDS. The retrieval of some or all of the documents may be performed in one downloading step with the documents encoded as Adobe Portable Document format (.pdf) files, which is an improvement over the current page-by-page retrieval capability from other USPTO systems.

Steps to Use the New E-Patent Reference Feature During the Pilot Project and Thereafter

Access to private PAIR is required to utilize E-Patent Reference. If you don't already have access to private PAIR, the Office urges practitioners, and applicants not represented by a practitioner, to take advantage of the transition period to obtain a no-cost USPTO Public Key Infrastructure (PKI) digital certificate, obtain a USPTO customer number, associate all of their pending and new application filings with their customer number, install no-cost software (supplied by the Office) required to access private PAIR and E-Patent Reference feature, and make appropriate arrangements for Internet access. The full instructions for obtaining a PKI digital certificate are available at the Office's Electronic Business Center (EBC) web page at: <http://www.uspto.gov/ebc/downloads.html>. Note that a notarized signature will be required to obtain a digital certificate.

To get a Customer Number, download and complete the Customer Number Request form, PTO-SB125, at: <http://www.uspto.gov/web/forms/sb0125.pdf>. The completed form can then be transmitted by facsimile to the Electronic Business Center at (703) 308-2840, or mailed to the address on the form. If you are a registered attorney or patent agent, then your registration number must be associated with your customer number. This is accomplished by adding your registration number to the Customer Number Request form. A description of associating a customer number with an application is described at the EBC web page at: http://www.uspto.gov/ebc/registration_pair.html.

The E-Patent Reference feature will be accessed using a new button on the private PAIR screen. Ordinarily all of the cited U.S. patent and U.S. patent application publication references will be available over the Internet using the Office's new E-Patent Reference feature. The size of the references to be downloaded will be displayed by E-Patent Reference so the download time can be estimated. Applicants and registered practitioners can select to download all of the references or any combination of cited references. Selected references will be downloaded as complete documents as Adobe Portable Document Format (.pdf) files. For a limited period of time, the USPTO will include a copy of this notice with Office actions to encourage applicants to use this new feature and, if needed, to take the steps outlined above in order to be able to utilize this new feature during the pilot and thereafter.

During the two-month pilot, the Office will evaluate the stability and capacity of the E-Patent Reference feature to reliably provide electronic access to cited U.S. patent and U.S. patent application publication references. While copies of U.S. patent and U.S. patent application publication references cited by examiners will continue to be mailed with Office actions during the pilot project, applicants are encouraged to use the private PAIR and the E-Patent Reference feature to electronically access and download cited U.S. patent and U.S. patent application publication references so the Office will be able to objectively evaluate its performance. The public is encouraged to submit comments to the Office on the usability and performance of the E-Patent Reference feature during the pilot. Further, during the pilot period registered practitioners, and applicants not represented by a practitioner, are encouraged to experiment with the feature, develop a proficiency in using the feature, and establish new internal processes for using the new access to the cited U.S. patents and U.S. patent application publications to prepare for the anticipated cessation of the current Office practice of supplying copies of such cited

references. The Office plans to continue to provide access to the E-Patent Reference feature during its evaluation of the pilot.

Comments

Comments concerning the E-Patent Reference feature should be in writing and directed to the Electronic Business Center (EBC) at the USPTO by electronic mail at eReference@uspto.gov or by facsimile to (703) 308-2840. Comments will be posted and made available for public inspection. To ensure that comments are considered in the evaluation of the pilot project, comments should be submitted in writing by January 15, 2004.

Comments with respect to specific applications should be sent to the Technology Centers' customer service centers. Comments concerning digital certificates, customer numbers, and associating customer numbers with applications should be sent to the Electronic Business Center (EBC) at the USPTO by facsimile at (703) 308-2840 or by e-mail at EBC@uspto.gov.

Implementation after Pilot

After the pilot, its evaluation, and publication of a subsequent notice as indicated above, the Office expects to implement its plan to cease mailing paper copies of U.S. patent references cited during examination of non provisional applications on or after February 2, 2004; although copies of cited foreign patent documents, as well as non-patent literature, will still be mailed to the applicant until such time as substantially all applications have been scanned into IFW.

For Further Information Contact

Technical information on the operation of the IFW system can be found on the USPTO website at <http://www.uspto.gov/web/patents/ifw/index.html>. Comments concerning the E-Patent Reference feature and questions concerning the operation of the PAIR system should be directed to the EBC at the USPTO at (866) 217-9197. The EBC may also be contacted by facsimile at (703) 308-2840 or by e-mail at EBC@uspto.gov.

Date. 12/1/03


Nicholas P. Godici
Commissioner for Patents